

## Insect Food of the Western Meadowlark

The present study of the insect food of the western meadowlark, *Sturnella neglecta* Audubon, further emphasizes its value to agriculture and its help in suppressing range insect pests in Utah. The following report is based on an examination of the stomach contents of 172 specimens collected in Utah during the eleven seasons 1932 through 1942, inclusive. Table 1 was prepared to indicate the number of recognizable insects present seasonally in the stomachs, arranged under the various insect orders. Fifty-two of the stomachs were collected April through June, 45 during July and August, and 75 in September and October.

Insect material still recognizable in the stomachs included: 242 adult and 92 nymphal grasshoppers, *Melanoplus mexicanus* Saus. being most frequently recognizable, besides 41 grasshopper eggs, doubtless digested from female abdomens; 14 Mormon cricket nymphs, *Anabrus simplex* Hald., 1 snowy tree cricket, *Oecanthus niveus* (De G.), 2 Jerusalem crickets, *Stenopelmatus longispina* Brunner, 1 coulee cricket, and 1 phasmid. Neuroptera recognized were 2 raphidids and 2 mantispids. Odonata, 2 dragonflies and 1 damselfly. Hemiptera included among the Lygaeidae, 41 false chinch bugs, *Nysius ericae* (Sch.), 1 *Lygaeus kalmii* Stal, 1 *Ligyrocoris nitidulus* (Uhl.), and 2 *Corizus hyalinus* Uhl.; the 42 Pentatomidae included 3 *Acrosternum hilaris* (Say), 11 *Brachymena sulcata* Van D., 2 *Chlorochroa uhleri* Stal, 7 *C. sayi* Stal, 2 *Euschista inflatus* Van D., 4 *Thyanta custator* (Fabr.); 3 Reduviidae included one *Reduvius personatus* (L.) and 1 *Sinea diadema* (Fabr.); among the Miridae were 4 *Lygus hesperius* Knight and 6 *L. elisus* Van D.; Coreidae, 1 *Carpocorus remota* Horv., 1 *Leptocoris trivittatus* Say, and 1 *Peribalus limbolaris* Stal; one Neididae; 6 Scutelleridae included 2 *Homaemus aenifrons* (Say). Among the Homoptera were 14 sugar-beet leafhoppers, *Eutettix tenellus* (Baker), one *Oncometopius lateralis* (Fabr.), and 11 pea aphids, *Macrosiphum pisi* (Kalt.). Coleoptera included 1 Gyrinidae, 105 Carabidae, 6 Silphidae of which 2 were *Silpha lapponica* Hbst.; 5 Staphylinidae; of the 4 Meloidae 1 was *Epicauta pennsylvanica* (De G.); 12 Elateridae, 1 a wireworm; 4 Buprestidae; 73 Dermestidae included 48 larvae, 1 adult *Dermestes frischi* Kug., 1 *D. marmoratus* Say, 1 *D. talpinus* Mann. and 3 *D. lardarius* L.; 20 Tenebrionidae; of 33 Scarabaeidae, 21 were of the genus *Aphodius*, mostly *Aphodius granarius* (L.) and *A. distinctus* Mull.; 1 Histeridae; 1 Lucanidae; 2 Cerambycidae; of 26 Chrysomelidae, 2 were larvae and 1 an adult asparagus beetle, *Crioceris asparagi* (L.) and 1 *Disonychia pennsylvanica* (Ill.); 3 Mylabridae, pea weevils, *Bruchus pisorum* (L.); 76 Curculionidae included 7 adult and 19 larval clover leaf weevils, *Hypera punctata* (Fabr.), 38 adult and 6 larval alfalfa weevils, *Phytonomus positicus* (Gyll.), and 7 strawberry root weevils, *Brachyrhinus ovatus* (L.) and *B. rugosostriatus* Goeze.

Lepidoptera included 13 beet webworms, *Loxostege sticticalis* L., of the family Pyralidae; of 223 specimens that appeared to be Phalaenidae larvae, at least 54 were army cutworms, *Chorizagrotis auxiliaris* (Grote) and 1 was a corn earworm, *Heliothis armigera* Hbn.; there were only 9 adult Lepidoptera recognized while 483 larvae were found. Diptera included 1 Tipulidae, 3 Chironomidae, 1 Culicidae, 2 Calliphoridae, and 2 Muscidae. Among recognizable Hymenoptera were 2 Tenthredinidae, 2 Chrysididae, 245 Formicidae, 2 Vespidae, 3 Sphecidae,

4 Andrenidae, 2 Megachilidae and 2 other wild bees. Recognized material other than insects was 36 spiders, 1 mite, 1 sowbug, 1 roundworm, 155 wheat and oat seeds beside numerous sunflower and other weed seeds, the total being 744 seeds; some plant material also was found.—G. F. Knowlton and D. R. Maddock, Utah Agricultural Experiment Station, Logan.

Table 1. Seasonal insect food recognized in 172 western meadowlark stomachs, collected 1932 through 1942.

| Order                | April, May, June<br>52 stomachs | July, August<br>45 stomachs | Sept., Oct.<br>75 stomachs | Total |
|----------------------|---------------------------------|-----------------------------|----------------------------|-------|
| Orthoptera           | 58                              | 180                         | 201                        | 439   |
| Isoptera             | 3                               | 0                           | 14                         | 17    |
| Neuroptera           | 1                               | 0                           | 3                          | 4     |
| Odonata              | 0                               | 3                           | 0                          | 3     |
| Hemiptera            | 77                              | 56                          | 71                         | 204   |
| Homoptera            | 13                              | 18                          | 3                          | 34    |
| Coleoptera           | 417                             | 111                         | 290                        | 818   |
| Trichoptera          | 0                               | 0                           | 1                          | 1     |
| Lepidoptera          | 390                             | 58                          | 44                         | 492   |
| Diptera              | 14                              | 1                           | 18                         | 33    |
| Hymenoptera          | 107                             | 55                          | 148                        | 310   |
| Total insects        | 1080                            | 482                         | 793                        | 2355  |
| Spiders and mites    | 23                              | 5                           | 9                          | 37    |
| Roundworms           | 1                               | 0                           | 0                          | 1     |
| Seeds of weeds, etc. | 14                              | 12                          | 563                        | 589   |